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EXAMINER	
CURS, NATHAN M	

ART UNIT	PAPER NUMBER
2633	

DATE MAILED: 02/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/944,603	Applicant(s) HANDELMAN, DORON	
	Examiner Nathan Curs	Art Unit 2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 12 October 2005.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-11,26-28 and 34-52 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-11,26-28,34-38,41-47 and 49-52 is/are rejected.

7)☒ Claim(s) 39,40 and 48 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 04 September 2001 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-11, 26-28, 34-38, 41-47 and 49-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. ("Lee") (US Patent No. 6288808) in view of Chraplyvy et al. ("Chraplyvy") (US Patent Application Publication No. 2003/0156841).

Regarding claims 1 and 26, Lee discloses an optical packet switching method and optical packet switch for use at a switching node that receives a first optical packet on a first input path and a second optical packet on a second input path, comprising: an inherent switching/routing control unit and at least one switching node operatively controlled by said switching/routing control unit operative for routing a first optical packet and a second optical packet to a destination at separate time slots over a single channel wavelength if the first packet bit-rate and the second packet bit-rate are the same (fig. 4, fig. 5 input group 4 and converted wavelength 4, fig. 6 and col. 4, line 26 to col. 5, line 32). Lee discloses routing signals of a WDM system using wavelength re-assignment combined with TDM to avoid collisions of packets, but does not disclose routing two packets to a destination using different wavelengths if a magnitude of a difference between the first packet bit-rate and the second packet bit-rate exceeds a bit-rate difference threshold. However, Chraplyvy discloses assigning WDM wavelengths of mixed bit-rate WDM signals so that low bit-rate channels with rates under a maximum bit-rate are assigned to WDM wavelengths having poorer SNR past the edges of the

pass band, or within the pass band, of the WDM system's optical amplifiers (figs. 4 and 5 and paragraphs 0019-0022). It would have been obvious to one of ordinary skill in the art at the time of the invention to transmit lower bit-rate signals using WDM edge wavelengths or poor-SNR wavelengths in the system of Lee by increasing the functionality of the WDM-to-TDM conversion modules of Lee to process low bit-rate signals for transmission using edge wavelengths or poor-SNR wavelengths, in order to enable input signals of a different bit rate in the collision-avoidance system of Lee, as well as to provide the advantage of increasing capacity and/or transmission over wavelengths with poor SNR.

Regarding claim 2, the combination of Lee and Chraplyvy discloses the method according to claim 1 and wherein each of said first optical packet and said second optical packet comprises one of the following: a fixed-length optical packet; and a variable-length optical packet (Lee: fig. 5, elements T and T/n and col. 4, lines 26-60).

Regarding claim 3, the combination of Lee and Chraplyvy discloses the method according to claim 1 and also comprising determining said magnitude of a difference between the first bit-rate and the second bit-rate prior to said routing (Chraplyvy: paragraph 0019, as applicable to wavelength assignment in the WDM-to-TDM conversion modules of the combination).

Regarding claim 4, the combination of Lee and Chraplyvy discloses the method according to claim 3, and discloses segregating low bit-rate signals from higher bit-rate signals for wavelength assignment, but does not explicitly disclose that the wavelength assignment involves comparing bit-rate identifiers, the identifiers derived from analyzing header information, to obtain the difference in bit-rates. However, Lee discloses ATM signals (col. 2, lines 62-65). It would have been obvious to one of ordinary skill in the art at the time of the invention that bit-

rate information could be derived for each signal by analyzing the inherent ATM cell headers of the ATM signals taught by Lee.

Regarding claim 5, the combination of Lee and Chraplyvy discloses the method according to claim 4 and wherein each of said first bit-rate identifier and said second bit-rate identifier comprises at least one of the following: a source identifier; a label; and an overhead byte (Lee: col. 2, lines 62-65, where ATM cell headers indicate overhead bytes).

Regarding claim 6, the combination of Lee and Chraplyvy discloses the method according to claim 1 and wherein said bit-rate difference threshold is about zero so that the single channel wavelength carries optical packets that are provided at substantially similar bit rates (Chraplyvy: paragraphs 0019-0022, where the low bit-rate signal of Chraplyvy is only required to be different enough from a higher bit rate signal to be able to work in an edge or poor SNR region of the WDM transmission spectrum).

Regarding claims 7 and 27, Lee discloses an optical packet switching method and optical packet switch for use at a switching node that receives a first optical packet on a first input path and a second optical packet on a second input path, comprising: an inherent switching/routing control unit and at least one switching node operatively controlled by said switching/routing control unit operative for routing a first optical packet and a second optical packet to a destination at separate time slots over a single switch (fig. 4, WDM-to-TDM Conversion Module) if the first packet bit-rate and the second packet bit-rate are the same (fig. 4, fig. 5, fig. 6 and col. 4, line 26 to col. 5, line 32). Lee discloses routing signals of a WDM system using wavelength re-assignment combined with TDM to avoid collisions of packets, but does not disclose routing two packets to a destination using different switches if a magnitude of a difference between the first packet bit-rate and the second packet bit-rate exceeds a bit-rate difference threshold. However, Chraplyvy discloses assigning WDM wavelengths of mixed bit-

rate WDM signals so that low bit-rate channels with rates under a maximum bit-rate are assigned to WDM wavelengths having poorer SNR past the edges of the pass band, or within the pass band, of the WDM system's optical amplifiers (figs. 4 and 5 and paragraphs 0019-0022). It would have been obvious to one of ordinary skill in the art at the time of the invention to transmit lower bit-rate signals using WDM edge wavelengths or poor-SNR wavelengths in the system of Lee by using a control unit operative to determine a magnitude of a difference between a first and second bit-rate and using additional, separate WDM-to-TDM conversion modules to process low bit-rate signals for transmission using edge wavelengths or poor-SNR wavelengths, in order to enable input signals of a different bit rate in the collision-avoidance system of Lee, as well as to provide the advantage of increasing capacity and/or transmission over wavelengths with poor SNR.

Regarding claim 8, the combination of Lee and Chraplyvy discloses the method according to claim 7 and wherein each of said first optical packet and said second optical packet comprises one of the following: a fixed-length optical packet; and a variable-length optical packet (Lee: fig. 5, elements T and T/n and col. 4, lines 26-60).

Regarding claims 9 and 28, Lee discloses an optical packet switching method and optical packet switch for use at a switching node that receives a first optical packet on a first input path and a second optical packet on a second input path, comprising: an inherent switching/routing control unit and at least one switching node operatively controlled by said switching/routing control unit for routing a first optical packet and a second optical packet to a destination at separate time slots over a single channel wavelength if the first packet bit-rate and the second packet bit-rate are the same (fig. 4, fig. 5 input group 4 and converted wavelength 4, fig. 6 and col. 4, line 26 to col. 5, line 32). Lee discloses routing signals of a WDM system using wavelength re-assignment combined with TDM to avoid collisions of

packets, but does not disclose grouping N series of packets received on N input paths at N bit-rates into K bit-rate groups (K<=N), each group assigned to one of K wavelengths, and routing the K groups to a destination. However, Chraplyvy discloses assigning WDM wavelengths of mixed bit-rate WDM signals so that low bit-rate channels with rates under a maximum bit-rate are assigned to WDM wavelengths having poorer SNR past the edges of the pass band, or within the pass band, of the WDM system's optical amplifiers, and where edge regions of the pass band are further subdivided, with the outermost edge regions assigned to the lowest bit-rate signals (figs. 4 and 5 and paragraphs 0019-0022). It would have been obvious to one of ordinary skill in the art at the time of the invention to transmit signals of varyingly lower bit-rates using WDM edge wavelengths or poor-SNR wavelengths in the system of Lee by increasing the functionality of the WDM-to-TDM conversion modules of Lee to process varyingly lower bit-rate signals for transmission using edge wavelengths or poor-SNR wavelengths, in order to enable input signals of different lower bit rates in the collision-avoidance system of Lee, as well as to provide the advantage of increasing capacity and/or transmission over wavelengths with poor SNR.

Regarding claim 10, the combination of Lee and Chraplyvy discloses the method according to claim 9 and wherein each optical packet in said N series of optical packets comprises one of the following: a fixed-length optical packet; and a variable-length optical packet (Lee: fig. 5, elements T and T/n and col. 4, lines 26-60).

Regarding claim 11, the combination of Lee and Chraplyvy discloses the method according to claim 9, and discloses segregating varyingly lower bit-rate signals from higher bit-rate signals for wavelength assignment, but does not explicitly disclose that the bit-rate based wavelength assignment involves comparing bit-rate identifiers, the identifiers derived from analyzing header information, to obtain the difference in bit-rates. However, Lee discloses ATM

signals (col. 2, lines 62-65). It would have been obvious to one of ordinary skill in the art at the time of the invention that bit-rate information could be derived for each signal by analyzing the inherent ATM cell headers of the ATM signals taught by Lee.

Regarding claim 34, the combination of Lee and Chraplyvy discloses the method according to claim 1 and also comprising receiving each of the first optical packet and the second optical packet at the switching node over the first channel wavelength prior to the routing (Lee: fig. 5, where the wavelengths assigned prior to routing are the destination-specific wavelengths).

Regarding claim 35, the combination of Lee and Chraplyvy discloses the method according to claim 1 and also comprising receiving each of the first optical packet and the second optical packet at the switching node over a channel wavelength other than the first channel wavelength and the second channel wavelength prior to the routing (Lee: fig. 5, where the wavelengths assigned prior to routing are the destination-specific wavelengths).

Regarding claim 36, the combination of Lee and Chraplyvy discloses the method according to claim 1 and wherein the single channel wavelength comprises one of the following: the first channel wavelength; the second channel wavelength; and a channel wavelength other than the first channel wavelength and the second channel wavelength (Lee: fig. 5).

Regarding claim 37, the combination of Lee and Chraplyvy discloses the method according to claim 1 and wherein the first channel wavelength and the second channel wavelength are comprised in the same wavelength band (Chraplyvy: figs. 4 and 5, where two bands are used, one for low bit rate and one for high bit rate, and destination wavelengths are assigned to packets appropriately within each band).

Regarding claim 38, the combination of Lee and Chraplyvy discloses the method according to claim 1 and wherein each of the first channel wavelength and the second channel

wavelength comprises a wavelength in a WDM wavelength band (Lee: figs. 4 and 5 and Chraplyvy: figs. 4 and 5). The combination does not explicitly mention the nanometer values of the wavelengths. However, official notice is taken that wavelengths on the order of tens nanometer around 1550 nm is very well known in the art for WDM transmission. It would have been obvious to one of ordinary skill in the art at the time of the invention that the WDM wavelengths of the combination would be on the order of tens nanometer around 1550 nm, since this wavelength distribution is very well known in the art for WDM transmission.

Regarding claim 41, the combination of Lee and Chraplyvy discloses the optical packet switch according to claim 26 and also comprising a first input port providing the first optical packet to the at least one switching node over the first channel wavelength, and a second input port providing the second optical packet to the at least one switching node over the first channel wavelength (Lee: fig. 5).

Regarding claim 42, the combination of Lee and Chraplyvy discloses the optical packet switch according to claim 26 and also comprising input ports providing the first optical packet and the second optical packet to the at least one switching node over channel wavelengths other than the first channel wavelength and the second channel wavelength (Lee: fig. 5).

Regarding claim 43, the combination of Lee and Chraplyvy discloses the optical packet switch according to claim 26 and wherein the single channel wavelength comprises one of the following: the first channel wavelength; the second channel wavelength; and a channel wavelength other than the first channel wavelength and the second channel wavelength (Lee: fig. 5).

Regarding claim 44, the combination of Lee and Chraplyvy discloses the optical packet switch according to claim 26 and wherein the first channel wavelength and the second channel wavelength are comprised in the same wavelength band (Chraplyvy: figs. 4 and 5, where two

bands are used, one for low bit rate and one for high bit rate, and destination wavelengths are assigned to packets appropriately within each band).

Regarding claim 45, the combination of Lee and Chraplyvy discloses. The optical packet switch according to claim 26 and wherein each of the first channel wavelength and the second channel wavelength comprises a wavelength in a WDM wavelength band (Lee: figs. 4 and 5 and Chraplyvy: figs. 4 and 5). The combination does not explicitly mention the nanometer values of the wavelengths. However, official notice is taken that wavelengths on the order of tens nanometer around 1550 nm is very well known in the art for WDM transmission. It would have been obvious to one of ordinary skill in the art at the time of the invention that the WDM wavelengths of the combination would be on the order of tens nanometer around 1550 nm, since this wavelength distribution is very well known in the art for WDM transmission.

Regarding claim 46, the combination of Lee and Chraplyvy discloses the optical packet switch according to claim 26 and operative in one of the following: half-duplex communication; and duplex communication (Lee: fig. 6 and col. 4, line 26 to col. 5, line 32).

Regarding claim 47, the combination of Lee and Chraplyvy discloses the optical packet switch according to claim 26 and wherein the at least one switching node comprises a passive switching node (Lee: fig. 6, element 43).

Regarding claim 49, the combination of Lee and Chraplyvy discloses the optical packet switch according to claim 26 and wherein the at least one switching node comprises an active switching node (Lee: fig. 5).

Regarding claim 50, the combination of Lee and Chraplyvy discloses the optical packet switch according to claim 49 and wherein the active switching node comprises at least one of the following: a wavelength converter; and a fiber delay line (FDL) (Lee: figs. 4 and 5).

Regarding claim 51, Lee discloses an optical packet switching method for use at a switching node that receives a first optical packet on a first input path and a second optical packet on a second input path, the method comprising: switching said first optical packet and said second optical packet to said destination via a single optical communication switch that is operatively associated with said destination (fig. 4, fig. 5 input group 4 and converted wavelength 4, fig. 6 and col. 4, line 26 to col. 5, line 32). Lee does not disclose that the first optical packet on the first input path is at a first bit-rate while the second optical packet on the second input path is at a second bit-rate, and does not disclose switching said first optical packet to a destination via a first optical communication switch that is operatively associated with said destination and said second optical packet to said destination via a second optical communication switch that is operatively associated with said destination. However, Chraplyvy discloses assigning WDM wavelengths of mixed bit-rate WDM signals so that low bit-rate channels with rates under a maximum bit-rate are assigned to WDM wavelengths having poorer SNR past the edges of the pass band, or within the pass band, of the WDM system's optical amplifiers (figs. 4 and 5 and paragraphs 0019-0022). It would have been obvious to one of ordinary skill in the art at the time of the invention to transmit lower bit-rate signals using WDM edge wavelengths or poor-SNR wavelengths in the system of Lee by increasing the functionality of the WDM-to-TDM conversion modules of Lee to process low bit-rate signals for transmission using edge wavelengths or poor-SNR wavelengths, the edge wavelengths becoming a second set of destination-specific wavelengths switched after the WDM-to-TDM conversion modules, in order to enable input signals of a different bit rate in the collision-avoidance system of Lee, as well as to provide the advantage of increasing capacity and/or transmission over wavelengths with poor SNR.

Regarding claim 52, the combination of Lee and Chraplyvy discloses the method according to claim 51 and wherein each of said first optical packet and said second optical packet comprises one of the following: a fixed-length optical packet; and a variable-length optical packet (Lee: fig. 5, elements T and T/n and col. 4, lines 26-60).

Allowable Subject Matter

3. Claims 39, 40 and 48 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

4. Applicant's arguments filed 12 October have been fully considered but they are not persuasive.

The applicant's argument that Lee does not refer to optical packets provided at different bit-rates is moot because the examiner already acknowledges as much in the combination. Chraplyvy provides the teaching of different bit rates, in light of WDM transmission. The applicant's argument that Chraplyvy does not refer to optical packets, switching or routing is not persuasive because a prior art reference is analogous if the reference is in the field of applicant's endeavor (in this case, WDM transmission). It's not true that all references in a 103 combination must be concerned with solving the same exact problem.

Further, the applicant's arguments against Lee in the combination of Lee and Chraplyvy are not persuasive because it appears the applicant misunderstands the teaching of Lee. The applicant's interpretation of Lee seems to be that the WDM-TDM module of Lee converts each incoming packet at a different wavelength x to an outgoing packet assigned to one of x TDM

timeslots on a single shared wavelength. This is an incorrect interpretation. Lee teaches each incoming packet at a different wavelength x converted to a destination-specific wavelength y and compressed and assigned a time slot while retaining its y wavelength. So, the resulting packets output from the WDM-TDM module of Lee are packets that are simultaneously WDM and TDM multiplexed. As taught by Lee, this scheme avoids collision of two packets that are initially traveling in parallel (with respect to time) on two different WDM wavelengths and are then converted to the same destination wavelength, as they would collide in time. The applicant's assertion that the low bit rate channels and the high bit rate channels of the combination will always be combined and routed together over "the primary wavelength of Lee", thus destroying the scheme of Chraplyvy, is false. The term "primary" used in Lee does not mean that the TDM packets are all traveling on a single wavelength. In the combination, the low bit rate channel group and the high bit rate channel group is each given a set of wavelengths to be used as destination-specific wavelengths in routing, based on the wavelength scheme taught by Chraplyvy.

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Conclusion

6. Any inquiry concerning this communication from the examiner should be directed to N. Curs whose telephone number is (571) 272-3028. The examiner can normally be reached on M-F (from 9 AM to 5 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan, can be reached at (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (800) 786-9199.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pairdirect.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

M. R. Sedighian
M. R. SEDIGHIAN
PRIMARY EXAMINER